

CONTENTS

<i>Preface</i>	ix
<i>Acknowledgments</i>	xiii
<i>Notes to the Instructor</i>	xv

PART I. PRINCIPLES

Chapter 1. Operating System Functions and Concepts

1.1 Introduction	3
1.2 Operating Systems	8
1.3 Resource Allocation	10
1.4 The Supervisor	14
1.5 Conclusion	17
Problems	17

Chapter 2. Processes

2.1 Introduction	19
2.2 Process Definition	21

2.3	Process Implementation	23
2.4	Process Communication	26
2.5	Low-Level Synchronization Primitives	30
2.6	High-Level Synchronization Primitives	38
2.7	Deadlocks	45
	Problems	49

Chapter 3. Processor Allocation

3.1	Introduction	52
3.2	Multiprogramming	54
3.3	Multiprogramming Scheduling Methods	56
3.4	Multilevel Scheduling	64
3.5	Final Remarks	66
	Problems	67

Chapter 4. Memory Management

4.1	Memory Management Functions	69
4.2	Linking Methods	72
4.3	Storage Allocation	74
4.4	Overlaying	76
4.5	Job Swapping	78
4.6	Segmentation	80
4.7	Paging	84
4.8	Segmentation with Paging	88
4.9	Linking Using Segmentation with Paging	91
	Problems	94

Chapter 5. Virtual Memory

5.1	Introduction	96
5.2	Hardware Devices for Virtual Memory	97
5.3	Allocation Strategies in Segmentation and Paging	100
5.4	Analysis of Paging Systems	109
5.5	Final Remarks	117
	Problems	117

PART II. TECHNIQUES

Chapter 6. I/O and Files

6.1	Introduction	123
6.2	I/O System	129

6.3	Basic File System	132
6.4	Logical File System	134
6.5	Access Methods	137
6.6	Data Base Management Systems	140
6.7	Example of a Simple File System	141
6.8	Conclusion	144
	Problems	145

Chapter 7. Protection

7.1	Introduction	148
7.2	Domains and Capabilities	151
7.3	Describing the Protection Status	153
7.4	Protection Implementation	155
7.5	Capability Passing and Format	158
7.6	Security	161
7.7	Conclusion	166
	Problems	166

Chapter 8. Design

8.1	Introduction	169
8.2	Design Methodology	170
8.3	A Design Approach	183
8.4	Project Management	186
8.5	Concluding Remarks	189
	Problems	190

Chapter 9. Implementation

9.1	Introduction	192
9.2	Choice of Implementation Language	194
9.3	Program Engineering	197
9.4	Program Verification	202
9.5	Performance Evaluation	208
9.6	Conclusion	217
	Problems	218

Chapter 10. Examples of Systems

10.1	Introduction	220
10.2	The SUE System	221
10.3	The Venus Operating System	232
10.4	Other Systems	239
	Problems	240

Appendix I. Data Structures

I.1	Definition of Terms	241
I.2	Sequential Allocation of Lists	242
I.3	Linked Lists	243
I.4	Management of Linked Lists	244
I.5	Stacks	246
I.6	Queues	247
I.7	Dequeues	247
I.8	Tables	248

Appendix II. Computational Structures

II.1	Introduction	249
II.2	Petri Nets	249
II.3	Computational Schemata	253
II.4	A Model for the Deadlock Problem	259
II.5	Conclusion	261

Appendix III. A Toy Operating System

III.1	Introduction	262
III.2	Simulated Hardware	263
III.3	The Toy Operating System	264
III.4	Conclusion	265

Annotated References	267
-----------------------------	-----

<i>Index</i>	289
--------------	-----